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DUALITY AND UNITY OF THE BRAIN

Unified Functioning and Specialisation of the Hemispheres

Proceedings of an International Symposium held at
The Wenner-Gren Center, Stockholm, May 29 – 31, 1986

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Opening Address*

Roger Sperry

(Read by David Ottoson)

Rather than address select aspects of our topic, or particular researches in which I have been involved, or to personally reminisce about golden "days that are no more" I plan to respond to Professor Ottoson's kind invitation to open this conference by reviewing briefly some related conceptual developments that, as much as the empirical findings themselves perhaps, are of general ongoing concern to all of us in science.

Back in the mid-1960s a number of things came together in psychobiology to cause a shift in theory away from behaviorism with its strictly objective, physical explanations, over to a new mentalist (for want of a better term) position accepting the causal efficacy of subjective or introspective mental events, in a supervening sense. Earlier arguments in neuroscience that had excluded any causal influence of consciousness and which seemingly had been closed, airtight and irrefutable, were discovered to have a flaw, a loophole or shortcoming, and to be outweighed by a new 'emergent interactionist' reasoning.

A new formula for mind-brain interaction was perceived that involved a revised philosophic stance described initially as a compromise between materialism and dualism because it integrated formerly contradictory features from opposite sides of the old dichotomy into a single consistent worldview framework.

Instead of excluding mind and spirit from science, as had been the dominant practice for more than half a century, the new outlook puts subjective, mental forces near the top of the brain's causal control hierarchy and gives them primacy in determining what a person is and does. These revisions allow one to retain belief in science and the scientific method and at the same time they reinforce traditional humanist values – and support also mentalist (rather than behaviorist) concepts of the conscious self, freedom of will and personhood.

Cognitive psychology, humanistic psychology, clinical, abnormal and related psychologies and psychiatries, as well as the social and other sciences that depend on introspective mental phenomena and subjective explanations gain a more prestigious scientific status in the new outlook. Cognitive states had formerly been conceived to be either in parallel with or identical to their neural correlates. Either way it was generally supposed that science could provide, in principle, a complete explanation of brain function and behavior strictly in terms of the neural correlates themselves without reference to the introspective phenomena, and this was taken to be the more rigorous

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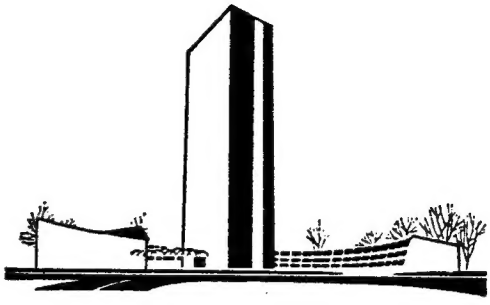
* Based on edited excerpts from recent papers of Sperry, this address was compiled and read by Professor David Ottoson when it was learned that Dr. Sperry would be unable to present opening remarks in person.

and more truly scientific way to go. Accordingly, reliance on subjective mental explanations tended to be put down as something short of true science.

In the new interactionist reasoning the cognitive properties are recognized to be different from, and more than, their collective neural correlates, to have their own dynamics and laws of interaction, and to exert downward emergent control over their physiological constituents. On these revised terms psychology, cognitive science and the social sciences represent distinct sciences in their own right at their own level with their own laws and principles that are not, even in theory, reducible to the kinds of laws which identify brain physiology or biophysics – though advancements in brain physiology should enormously enhance their understanding. Modified concepts incorporating 'downward causation' give the higher cognitive forces in brain processing control over the lower forces of neurophysiology.

The new outlook in behavioral science is found on analysis to rest on a shift to a revised form of causal determinism. Specifically, it involves a switch from traditional microdeterminism, in which everything is determined exclusively from below upward following the course of evolution, to a paradigm that gives due emphasis to macrodeterminism in which higher emergent properties of organizational hierarchies at all levels interact autonomously at their own level and also exert downward supervenient control over the subelements at lower levels. The bottom-up controls are retained but are supplemented with top-down controls. The recent view is believed to represent a more valid paradigm for all science, not just behavioral science.

This new 'macro' mentalist paradigm profoundly transforms the traditional scientific descriptions of ourselves and the world. Among other things it turns around the science-values relation and largely resolves the dilemma of free-will and determinism. More relevant to our present conference, it also changes our conceptions of the causal controls in physical brain processing and provides an explanation of why the left and right hemispheres, though they may each, when surgically separated, function differentially each as a separate conscious unit, may nevertheless when normally joined together, function together as a single conscious self.



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May 29–31, 1986

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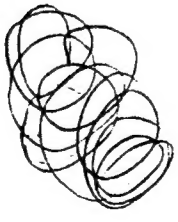

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